SENSORY EVALUATION OF THE POTATO STARCH PUDDING: AS AN AFFORDABLE WAY OF ESSENTIAL NUTRIENTS FOR HUMAN CONSUMPTION

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ABSTRACT

The purpose of this study was to examine the nutritional value and energy content of potato pudding as an affordable way to get important nutrients such proteins, vitamins, and other energy components. Potatoes are a commonly available and reasonably priced staple item. Using them in pudding form presents an interesting way to feed people on a budget. This essay looks at the ingredients, health advantages, and possibilities as a high-energy food source of potato pudding. The objective of this work was to develop and characterize a new pudding recipe using potato flour as the main ingredient. The recipe was formulated by varying the ratios of potato flour and milk powder and by adjusting the sugar levels. The resulting puddings were evaluated for their texture, nutritional composition and sensory characteristics. The findings showed that the potato flour and milk powder-based pudding had a creamy texture with a smooth mouthfeel. The sensory assessment revealed a non-significant (p < 0.05) difference between potato pudding and control, suggesting that potato pudding formulations have a high potential to substitute potato starch.

Keywords: Starch, Vitamins, Nutrition, Potato flour, Sensory evaluation

INTRODUCTION:

The potato (Solanum tuberosum), an annual plant belonging to the nightshade family (Solanaceae), is cultivated for its starchy tubers that are edible (Senguttuvan et al., 2014). Originating from the Peruvian-Bolivian Andes, the potato has become a key global consumed food crop. Potatoes can be prepared in various ways, such as boiling, mashing, frying, and baking, making them a staple ingredient in numerous culinary dishes (A. Kaur et al., 2007). The majority of the crop (68%) is eaten for table, 7.5% is used for processing, 8.5% is used for seed, and 16% is disposed of as waste as a result of improper post-harvest handling (Marwaha et al., 2010). Potatoes are widely consumed globally and have a significant presence in various diets. Beyond their culinary uses, potato starch has gained recognition for its diverse industrial applications, ranging from food additives to emerging fields like nanotechnology and bioengineering. This versatile ingredient showcases its potential in multiple sectors, highlighting its importance and relevance in today’s world (Jagadeesan et al., 2020). Similar to other plant-based foods, the nutritional makeup of potatoes is influenced by various factors both before and after harvesting. Pre-harvest elements such as environmental conditions, cultural practices, maturity at harvest, and biotic and abiotic stresses, along with post-harvest factors like processing, storage, and transport, collectively impact the nutritional composition of potatoes (M. Kaur et al., 2011). These include carbohydrates with starch being the primary form, as well as protein, vitamins (particularly vitamin C), minerals, dietary fiber, phenolics, and various other bioactive compounds (Xu et al., 2023). Additionally, potatoes contain inherent anti-nutrients like glycol alkaloids and nitrates, which when present in elevated levels, can pose health risks to humans (Elżbieta, 2012). This Plant based food, potato has earned global popularity as a widely consumed food crop due to their impressive yield per unit area, cost-effectiveness, and widespread daily consumption (Foley et al.,...
Potatoes are a good source of dietary fiber, which aids in digestion and promotes a healthy digestive system. Consuming potatoes with their skin can increase fiber intake (Dupuis & Liu, 2019).

Sensory Evaluation: A product or food's qualities are scrutinized through the panelists' senses (sight, smell, taste, touch, and hearing) in a sensory analysis. Various consumer and sensory surveys are also incorporated and are applied in the creation of highly diverse new items (Jaiswal et al., 2023).

Pudding mix (25g) was suspended in 25ml of milk in a plastic container to make a paste for sensory evaluation. After boiling, 225 ml of the left over milk were used. Then, to make hot gruel, pudding paste was gradually added to the boiling milk while the mixture was constantly stirred for 1-2 minutes. Twenty semi-trained panelists, including university personnel and students, were given warm pudding gruel samples. A nine-point hedonic scale was used to rate the samples based on appearance, colour, flavor, odor, taste, and overall acceptability. (1 = Dislike extremely, and 9 = Like extremely). The samples were served in color-coded plastic cups. Comparative Analysis.

RESULTS AND DISCUSSION

Sensory evaluation: The quality of the final product is affected by many factors, such as the conditions of preparation, the way it is packaged, as well as storage. The sensory characteristics of the formulated pudding mix are depicted in fig.1, reveals that the Potato pudding mix has high acceptability scores for appearance, flavor, color, odor and taste. The results indicated that Potato pudding from Potato

<table>
<thead>
<tr>
<th>Nutritional parameters:</th>
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<tbody>
<tr>
<td>Per 50gms or 5 servings</td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>255</td>
</tr>
<tr>
<td>Total fat</td>
<td>12.68g</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>7.44g</td>
</tr>
<tr>
<td>Sodium</td>
<td>100mg</td>
</tr>
<tr>
<td>Total carbohydrate</td>
<td>30.55g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0.92g</td>
</tr>
<tr>
<td>Sugars</td>
<td>19.71g</td>
</tr>
<tr>
<td>Protein</td>
<td>6.17g</td>
</tr>
</tbody>
</table>
Rice flour has made it feasible to use in various food systems or other industrial applications (Mulambu, 2017). The parameters of the raw materials used in production and their mutual proportions also play an important role. The water content of starch should not exceed 20%, which is related to the microbiological risk of the material and its rapid spoilage. The addition of juice to potato starch mixture caused a delay in the pasting. The addition of natural fibers to starches influences their properties. The thickening base in the present systems was potato starch (normal and waxy) and corn starch (normal and waxy). Waxy forms of starch are appreciated in the design of various types of desserts because they are characterized by the appropriate consistency and hardness of the resulting pudding (Chawla R, et al. 2010, Kaur M, et al. 2011). The texture starch contributes to the texture of potato pudding by absorbing moisture and forming a gel-like structure during cooking. The amount of starch used and the cooking method will determine the final texture. Too much starch can result in a gummy or overly thick pudding, while too little may make it runny or loose. Properly cooked starch gives the pudding a smooth, creamy texture that is both pleasing to the palate and visually appealing (Lewandowicz G, et al., 2003). Starch influences the release of flavors in potato pudding. As starch gelatinizes during cooking, it traps and suspends flavor compounds, enhancing their release upon consumption. This ensures that the flavors of the pudding are well-distributed and enjoyed with each bite (Alakali, J.S, et al., 2008). Starch affects the appearance of potato pudding by providing structure and stability. It helps hold the pudding together and prevents it from separating or becoming watery. Additionally, starch contributes to the pudding’s smooth and glossy surface, enhancing its visual appeal (Li S et al., 2022).

![Figure 1](image1.png)

Figure 1. Sensory evaluation of fresh pudding mix.

![Figure 2](image2.png)

Figure 2. Sensory evaluation graph of Potato pudding mix. Each bar denotes the frequency of the overall key scores.
CONCLUSION
The study's findings proved that the improved recipe for potato flour pudding had a smooth, creamy mouthfeel. The sensory evaluation of the potato pudding and control showed a non-significant (p < 0.05) difference, indicating that potato pudding formulations have a high potential to replace potato starch. This means that obtaining essential nutrients like proteins, vitamins, and other energy components at a reasonable price can be accomplished with potato pudding

REFERENCES
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Anti-inflammatory properties of potato glycoalkaloids in stimulated Jurkat and Raw 264.7 mouse macrophages. Life Sciences, 92(13), 775–782.